10. GLOSSARY

Accident Sequence — With regard to nuclear facilities, an initiating event followed by system failures or operator errors, which can result in significant core damage, confinement system failure, and/or radionuclide releases.

Activation Products — Nuclei, usually radioactive, formed by the bombardment and absorption of material with neutrons, protons, or other nuclear particles.

Acute Exposure — The exposure incurred during and shortly after a radiological release. Generally, the period of acute exposure ends when long-term interdiction is established, as necessary. The period of acute exposure is generally assumed to end 1 week after the inception of a radiological accident.

Air Pollutant — Any substance in the air which could, if in a high-enough concentration, harm man, animals, vegetation, or material.

Air Quality Control Region — Geographic subdivisions of the United States, designed to deal with pollution on a regional or local level. Some regions span more than one state.

Alpha Activity — The emission of alpha particles by radioactive materials.

Alpha Particle — A positively charged particle, consisting of two protons and two neutrons, that is emitted during radioactive decay from the nucleus of certain nuclides. It is the least penetrating of the three common types of radiation (alpha, beta, and gamma).

Alpha Wastes — Wastes containing radioactive isotopes that decay by producing alpha particles.

Ambient — Surrounding.

Ambient Air — The surrounding atmosphere as it exists around people, plants, and structures. Air quality standards are used to provide a measure of the health-related and visual characteristics of the air.

Ambient Air Quality Standards — The level of pollutants in the air prescribed by regulations that may not be exceeded during a specified time in a defined area.

Aquatic — Living or growing in, on, or near water.

Aquatic Biota — The sum total of living organisms within any designated aquatic area.

Aquatic Macrophytes — Visible plants occurring in water.

Aquifer — A saturated geologic unit through which significant quantities of water can migrate under natural hydraulic gradients.

Archaic — Artifacts from the North American archaeological period dating from 8000 B.C. to 1000 B.C.

***Archaeological Sites (resources)* —** Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

***Artifact* —** An object produced or shaped by human workmanship of archaeological or historical interest.

***As Low as Reasonably Achievable (ALARA)* —** A concept applied to ensure the quantity of radioactivity released to the environment and the radiation exposure of onsite workers in routine operations, including "anticipated operational occurrences," is maintained as low as reasonably achievable. It takes into account the state of technology, economics of improvements in relation to benefits to public health and safety, and other societal and economic considerations in relation to the use of nuclear energy in the public interest.

***Atmospheric Dispersion* —** The process of air pollutants being dispersed in the atmosphere. This occurs by the wind that carries the pollutants away from their source, and by turbulent air motion that results from solar heating of the Earth's surface and air movement over rough terrain and surfaces.

***Atomic Energy Act of 1954, as amended* —** The statute that established U.S. requirements with respect to nuclear energy and nuclear materials. This Act, as amended, provides the statutory framework for government control of the possession, use, and production of atomic energy, special nuclear material, and other radioactive material, whether owned by the government or others.

***Atomic Energy Commission (AEC)* —** A five-member commission, established by the *Atomic Energy Act* of 1946, to supervise nuclear weapons design, development, manufacturing, maintenance, modification, and dismantlement. In 1974, the Atomic Energy Commission was abolished and all functions were transferred to the Nuclear Regulatory Commission and the Administrator of the Energy Research and Development Administration. The Energy Research and Development Administration was later terminated and its functions, vested by law in the Administrator, were transferred to the Secretary of Energy.

***Background Radiation* —** Ionizing radiation present in the environment from cosmic rays and natural sources in the Earth; background radiation varies considerably with location.

***Badged Worker* —** A worker who has the potential to be exposed to radiation and is equipped with a dosimeter to measure his/her dose.

***Barrier* —** Any material or structure that prevents or substantially delays movement of radionuclides toward the accessible environment.

***Baseline* —** A quantitative expression of conditions, costs, schedule, or technical progress to serve as a base or standard for measurement during the performance of an effort; the established plan against which the status of resources and progress of a project can be measured. For this environmental impact statement, the environmental baseline is the site environmental conditions as they exist or have been estimated to exist in the absence of the proposed action.

***BEIR V* —** Biological Effects of Ionizing Radiation; referring to the fifth in a series of committee reports from the National Research Council.

***Benthic* —** Plants and animals dwelling at the bottom of oceans, lakes, rivers, and other surface waters.

***Beta Particle* —** A charged particle emitted from the nucleus of an atom during radioactive decay. A negatively charged beta particle is identical to an electron; a positively charged beta particle is called a "positron."

***Biodiversity* —** The diversity of life in all its forms and all its levels of organization. Also termed "biological diversity."

***Biota (biotic)* —** The plant and animal life of a region (pertaining to biota).

***Block* —** U.S. Bureau of the Census term describing small areas bounded on all sides by visible features or political boundaries; used in tabulation of census data.

***Block Groups* —** U.S. Bureau of the Census term describing a cluster of blocks generally selected to include 250 to 550 housing units.

***Blowdown* —** A maintenance procedure to remove sediment in power plant components.

***Boiler* —** A pressurized system in which water is vaporized to steam, the desired end product, by heat transferred from a source of higher temperature, usually the products of combustion from burning fuels.

***Boiling Water Reactor* —** A type of nuclear reactor that uses fission heat to generate steam in the reactor core or vessel to drive turbines and generate electricity.

***Boost* —** The process by which fusion of deuterium-tritium gas inside the pit of a nuclear weapon produces neutrons that increase the fission output of the primary.

***Boron-10* —** An isotope of the element boron that has a high-capture cross-section for neutrons. It is used in reactor absorber rods for reactor control.

***Burial Ground* —** With regard to radioactive wastes, a place for burying unwanted (i.e., radioactive) materials in which the earth acts as a receptacle to prevent the escape of radiation and the dispersion of wastes in the environment.

***Burnable Absorber* —** A material, such as boron or lithium, that captures neutrons and transmutes or changes to another isotope.

***Burnable Poison Rod* —** A nuclear reactor rod used to capture or absorb neutrons created in the core by the fission reactions during the early core life.

***Cancer* —** The name given to a group of diseases characterized by uncontrolled cellular growth with cells having invasive characteristics such that the disease can transfer from one organ to another.

***Capable Fault* —** A fault that has exhibited one or more of the following characteristics:

(1) Movement at or near the ground surface at least once within the past 35,000 years or movement of a recurring nature within the past 500,000 years.

(2) Macro-seismicity instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault.

(3) A structural relationship to a capable fault according to characteristics (1) or (2) of this paragraph such that movement on one could be reasonably expected to be accompanied by movement on the other.

***Capacity Factor* —** The ratio of the annual average power production of a power plant to its rated capacity.

Carbon Dioxide (CO_2) — A colorless, odorless gas that is a normal component of the ambient air; it results from fossil fuel combustion and is an expiration product.

Carboniferous Age — Noting or pertaining to a period of the Paleozoic era, including the Pennsylvanian, Mississippian, and formerly the Permian periods as epochs: from 270 million to 350 million years ago.

Carbon Monoxide (CO) — A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion.

Cask — A heavily shielded container that meets U.S. Nuclear Regulatory Commission and U.S. Department of Transportation regulatory requirements and is used to store and/or ship radioactive materials (i.e., spent nuclear fuel, irradiated tritium-producing burnable absorber rods, or high-level waste). Lead, depleted uranium, and steel are common materials used in the manufacture of casks.

Cesium — A silver-white alkali metal. A radioactive isotope of cesium, cesium-137, is a common fission product.

Chain Reaction — A reaction that initiates its own repetition. In a fission chain reaction, a fissionable nucleus absorbs a neutron and fissions spontaneously, releasing additional neutrons. These, in turn, can be absorbed by other fissionable nuclei, releasing still more neutrons. A fission chain reaction is self-sustaining when the number of neutrons is constant or increases over a period of time.

Chemical Oxygen Demand — A measure of the quantity of chemically oxidizable components present in water.

Chronic Exposure — Low-level radiation exposure incurred over a long time period due to residual contamination.

Cladding — The metal tube that forms the outer jacket of a nuclear fuel rod or burnable absorber rod. It prevents the release of radioactive material into the coolant. Stainless steel and zirconium alloys are common cladding materials.

Class I Areas — National parks and wilderness areas designated by the Prevention of Significant Deterioration section of the Clean Air Act amendments. These amendments and the implementing regulations provide special protection to air quality and air quality-related values in such areas. Only very slight deterioration of air quality is allowed in Class I areas.

Class II Areas — Most of the country not designated as Class I is designated as Class II. Class II areas are generally cleaner than air quality standards require and moderate increases in new pollution are allowed after a regulatory-mandated impacts review.

Claystone — A massive sedimentary rock made up largely of clay minerals having the composition of shale, but lacking its fine lamination.

Clean Air Act — This Act mandates and provides for enforcement of regulations to control air pollution from various sources.

Clear Air Act Amendments of 1990 — Expands the Environmental Protection Agency's enforcement powers and adds restrictions on air toxics, ozone-depleting chemicals, stationary and mobile emissions sources, and emissions implicated in rain and global warming.

Clean Water Act of 1972, 1987 — This Act regulates the discharge of pollutants from a point source into navigable waters of the United States in compliance with a National Pollution Discharge Elimination System permit, as well as discharges to or dredging of wetlands.

Climatology — The science that deals with climates and investigates their phenomena and causes.

Code of Federal Regulations (CFR) — All Federal regulations in force are published in codified form in the Code of Federal Regulations.

Cold Standby — Maintenance of a protected reactor condition in which the fuel is removed, the moderator is stored in tanks, and equipment and system lay-up is performed to prevent deterioration, such that future refueling and restart are possible.

Collective Committed Effective Dose Equivalent — The committed effective dose equivalent of radiation for a population.

Commercial Light Water Reactor (CLWR) — A term used to describe commercially operated power-producing U.S. reactors that use "light" (as opposed to "heavy") water for cooling and neutron moderation.

Committed Dose Equivalent — The predicted total dose equivalent to a tissue or organ over a 50-year period after an intake of a radionuclide into the body. It does not include external dose contributions. Committed dose equivalent is expressed in units of rem or Sievert. The committed effective dose equivalent is the sum of the committed dose equivalents to various tissues of the body, each multiplied by the appropriate weighting factor.

Community (biotic) — All plants and animals occupying a specific area under relatively similar conditions.

Complex — The Nuclear Weapons Complex, which is a set of Federal sites and government-owned/ contractor-operated facilities administered by the U.S. Department of Energy.

Comprehensive Test Ban Treaty — A proposed treaty prohibiting nuclear tests of all magnitudes.

Computational Modeling — The use of a computer to develop a mathematical model of a complex system or process and to provide conditions for testing it.

Conformity — Conformity is defined in the Clean Air Act as the action's compliance with an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of such standards; and that such activities will not: (1) cause or contribute to any new violation of any standard in any area; (2) increase the frequency or severity of any existing violation of any standard in any area; or (3) delay timely attainment of any standard or any required interim emission reduction or other milestones in any area.

Consumptive Water Use — The difference in the volume of water withdrawn from a body of water and the amount released back into the body of water.

Container — With regard to radioactive wastes, the metal envelope in the waste package that provides the primary containment function of the waste package and is designed to meet the containment requirements of 10 CFR 60.

Containment Design-Basis — For a nuclear reactor, those bounding conditions for the design of the containment, including temperature, pressure, and leakage rate. Because the containment is provided as an

additional barrier to mitigate the consequences of accidents involving the release of radioactive materials, the containment design-basis may include an additional specified margin above those conditions expected to result from the plant design-basis accidents to ensure that the containment design can mitigate unlikely or unforeseen events.

Control Rod — A rod containing material such as boron that is used to control the power of a nuclear reactor. By absorbing excess neutrons, a control rod prevents the neutrons from causing further fissions; i.e., increasing power.

Coolant — A substance, either gas or liquid, circulated though a nuclear reactor or processing plant to remove heat.

Cooperating Agency — Any other Federal agency having jurisdiction or special expertise with respect to any environmental issue.

Credible Accident — An accident that has a probability of occurrence greater than or equal to one in a million years.

Criteria Pollutants — The Clean Air Act required the U.S. Environmental Protection Agency to set air quality standards for common and widespread pollutants after preparing "criteria documents" summarizing scientific knowledge on their health effects. Today there are standards in effect for six "criteria pollutants": sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter less than or equal to 10 microns in diameter (PM_{10}) and less than or equal to 2.5 microns in diameter ($PM_{2.5}$), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb).

Critical Habitat — Defined in the *Endangered Species Act* of 1973 as "specific areas within the geographical area occupied by [an endangered or threatened] species, essential to the conservation of the species and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species that are essential for the conservation of the species."

Criticality — A reactor state in which a self-sustaining nuclear chain reaction is achieved.

Cultural Resources — Archaeological sites, historical sites, architectural features, traditional use areas, and Native American sacred sites.

Cumulative Impacts — In an environmental impact statement, the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal), private industry, or individual(s) undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Curie (Ci) — A unit of radioactivity equal to 37 billion disintegrations per second; also a quantity of any nuclide or mixture of nuclides having 1 Curie radioactivity.

Day-Night Average Sound Level — The 24-hour A-weighted equivalent sound level expressed in decibels, with a 10-decibel penalty added to sound levels between 10:00 p.m. and 7:00 a.m. to account for increased annoyance due to noise during nighttime hours.

Decay Heat (radioactivity) — The heat produced by the decay of certain radionuclides.

Decay (radioactive) — The decrease in the amount of any radioactive material with the passage of time due to the spontaneous transformation of an unstable nuclide into a different nuclide or into a different energy state of the same nuclide; the emission of nuclear radiation (alpha, beta, or gamma radiation) is part of the process.

Decibel (dB) — A logarithmic unit of sound measurement which describes the magnitude of a particular quantity of sound pressure power with respect to a standard reference value. In general, a sound doubles in loudness for every increase of 10 decibels.

Decibel, A-weighted (dBA) — A unit of frequency weighted sound pressure level, measured by the use of a metering characteristic and the "A" weighting specified by the American National Standards Institution ANSI S1.4-1983 (R1594), that accounts for the frequency response of the human ear.

Deciduous — Trees which shed leaves at a certain season.

Decontamination — The actions taken to reduce or remove substances that pose a substantial present or potential hazard to human health or the environment, such as radioactive or chemical contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning, or other techniques.

Deposition — In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles ("dry deposition") or their removal from the air to the ground by precipitation ("wet deposition" or "rainout").

Design-Basis — For nuclear facilities, information that identifies the specific functions to be performed by a structure, system, or component and the specific values (or ranges of values) chosen for controlling parameters for reference bounds for design. These values may be: (1) restraints derived from generally accepted state-of-the-art practices for achieving functional goals; (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals; or (3) requirements derived from Federal safety objectives, principles, goals, or requirements.

Design-Basis Accident — For nuclear facilities, a postulated abnormal event that is used to establish the performance requirements of structures, systems, and components that are necessary to: (1) maintain them in a safe shutdown condition indefinitely; or (2) prevent or mitigate the consequences of the design-basis accident so that the general public and operating staff are not exposed to radiation in excess of appropriate guideline values.

Design-Basis Events — Postulated disturbances in process variables that can potentially lead to design-basis accidents.

Deuterium — A nonradioactive isotope of the element hydrogen with one neutron and one proton in the atomic nucleus.

Direct Economic Effects — The initial increases in output from different sectors of the economy resulting from some new activity within a predefined geographic region.

Direct Effect Multiplier — The total change in regional earnings and employment in all related industries as a result of a one-dollar change in earnings and a one-job change in a given industry.

Direct Jobs — The number of workers required at a site to implement an alternative.

Disposition — The ultimate "fate" or end use of a surplus U.S. Department of Energy facility following the transfer of the facility to the Office of the Assistant Secretary for Environmental Management.

Dose — The energy imparted to matter by ionizing radiation. The unit of absorbed dose is the rad.

Dose Commitment — The dose an organ or tissue would receive during a specified period of time (e.g., 50 to 100 years) as a result of intake (by ingestion or inhalation) of one or more radionuclides from a defined release, frequently over a year's time.

Dose Equivalent — The product of absorbed dose in rad (or Gray) and a quality factor, which quantifies the effect of this type of radiation in tissue. Dose equivalent is expressed in units of rem or Sievert, where 1 rem equals 0.01 Sievert.

Dosimeter — A small device (instrument) carried by a radiation worker that measures cumulative radiation dose (e.g., film badge or ionization chamber).

Drift — Effluent mist or spray carried into the atmosphere from cooling towers.

Drinking Water Standards — The level of constituents or characteristics in a drinking water supply specified in regulations under the Safe Drinking Water Act as the maximum permissible.

Dual Use/Dual Benefit — Projects that have uses in or benefits for the defense sector and the private industry or civilian sector.

Effective Dose Equivalent — The sum of the products of the dose equivalent received by specified tissues of the body and a tissue-specific weighting factor. This sum is a risk-equivalent value and can be used to estimate the health effects risk to the exposed individual. The tissue-specific weighting factor represents the fraction of the total health risk resulting from uniform whole-body irradiation that would be contributed by that particular tissue. The effective dose equivalent includes the committed effective dose equivalent from internal deposition of radionuclides, and the effective dose equivalent due to penetrating radiation from sources external to the body. Effective dose equivalent is expressed in units of rem or Sievert.

Effluent — A gas or fluid discharged into the environment.

Effluent (liquid) — Wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall; generally refers to wastes discharged into surface waters.

Electromagnetic Fields — Two types of energy fields which are emitted from any device that generates, transmits, or uses electricity.

Emergency Condition — For a nuclear facility, occurrences or accidents that might occur infrequently during startup testing or operation of the facility. Equipment, components, and structures might be deformed by these conditions to the extent that repair is required prior to reuse.

Emission — A material discharged into the atmosphere from a source operation or activity.

Emission Standards — Legally enforceable limits on the quantities and/or kinds of air contaminants that may be emitted into the atmosphere.

Empirical — Something that is based on actual measurement, observation, or experience rather than on theory.

Endangered Species — Any species which is in danger of extinction throughout all or significant portions of its range. The Endangered Species Act of 1973, as amended, establishes procedures for placing species on the Federal lists of endangered or threatened species.

Endangered Species Act of 1973 — The Act requires Federal agencies, with the consultation and assistance of the Secretaries of the Interior and Commerce, to ensure that their actions likely will not jeopardize the continued existence of any endangered or threatened species or adversely affect the habitat of such species.

Engineered Safety Features — For a nuclear facility, features that prevent, limit, or mitigate the release of radioactive material from its primary containment.

Enriched Uranium — Uranium in which the abundance of the isotope uranium-235 is increased above the normal (naturally occurring) level of 0.711 weight percent.

Entrainment — The involuntary capture and inclusion of organisms in streams of flowing water; a term often applied to the cooling water systems of power plants/reactors. The organisms involved may include phyto- and zooplankton, fish eggs and larvae (ichthyoplankton), shellfish larvae, and other forms of aquatic life.

Environment, Safety, and Health Program — In the context of the U.S. Department of Energy (DOE), encompasses those DOE requirements, activities, and functions in the conduct of all DOE and DOE-controlled operations that are concerned with: impacts to the biosphere; compliance with environmental laws, regulations, and standards controlling air, water, and soil pollution; limiting the risks to the well-being of both the operating personnel and the general public; and protecting property against accidental loss or damage. Typical activities and functions related to this program include, but are not limited to, environmental protection, occupational safety, fire protection, industrial hygiene, health physics, occupational medicine, process and facilities safety, nuclear safety, emergency preparedness, quality assurance, and radioactive and hazardous waste management.

Environmental Assessment — A written environmental analysis prepared pursuant to the National Environmental Policy Act. This assessment is performed to determine whether a Federal action could significantly affect the environment and thus require preparation of a more detailed environmental impact statement. If the action will not significantly affect the environment, then a Finding of No Significant Impact is prepared.

Environmental Impact Statement (EIS) — A document required of Federal agencies by the National Environmental Policy Act for major proposals or legislation significantly affecting the environment. A tool for decisionmaking, it describes the positive and negative effects of the undertaking and alternative actions.

Environmental Justice — The fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no population of people should be forced to shoulder a disproportionate share of the negative environmental impacts of pollution or environmental hazards due to a lack of political or economic influence.

Environmental Survey — A documented, multidisciplined assessment (with sampling and analysis) of a facility to determine environmental conditions and to identify environmental problems requiring corrective action.

Epidemiology — The science concerned with the study of events that determine and influence the frequency and distribution of disease, injury, and other health-related events and their causes in a defined human population.

Equivalent Sound (Pressure) Level — The equivalent steady sound level that, if continuous during a specified time period, would contain the same total energy as the actual time varying sound. For example, L_{eq} (1-h) and L_{eq} (24-h) are the 1-hour and 24-hour equivalent sound levels, respectively.

Exposure Limit — The level of exposure to a hazardous chemical (set by law or a standard) at which or below which adverse human health effects are not expected to occur:

(1) Reference dose is the chronic exposure dose (milligrams or kilograms per day) for a given hazardous chemical at which or below which adverse human noncancer health effects are not expected to occur.

(2) Reference concentration is the chronic exposure concentration (milligrams per cubic meter) for a given hazardous chemical at which or below which adverse human noncancer health effects are not expected to occur.

Fault — A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred. A normal fault occurs when the hanging wall has been depressed in relation to the footwall. A reverse fault occurs when the hanging wall has been raised in relation to the footwall.

Finding of No Significant Impact — A document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded, will not have a significant effect on the human environment and will not require an environmental impact statement under the National Environmental Policy Act.

Fissile Materials — Although sometimes used as a synonym for fissionable material, this term has acquired a more restricted meaning, namely, any material fissionable by thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239.

Fission (Fissioning) — The splitting of a nucleus into at least two other nuclei and the release of a relatively large amount of energy. Two or three neutrons are usually released during this type of transformation.

Fission Products — Nuclei formed by the fission of heavy elements (primary fission products); also, the nuclei formed by the decay of the primary fission products, many of which are radioactive.

Fissionable Material — Material that could undergo fission by fast neutrons.

Floodplain — The lowlands adjoining inland and coastal waters and relatively flat areas.

Flux — Rate of flow through a unit area; in reactor operation, the apparent flow of neutrons in a defined energy range (see neutron flux).

Formation — In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

Fuel Assembly — A cluster of fuel rods (or plates). Also called a fuel element. Approximately 200 fuel assemblies make up a reactor core.

Fuel Rod — Nuclear reactor component that includes the fissile material.

Fugitive Emissions — Emissions to the atmosphere from pumps, valves, flanges, seals, and other process points not vented through a stack. Also includes emissions from area sources such as ponds, lagoons, landfills, piles of stored material, and exposed soil.

Fusion — Nuclear reaction in which light nuclei are fused together to form a heavier nucleus, accompanied by the release of energy and fast neutrons.

Gamma Rays — High-energy, short-wavelength, electromagnetic radiation accompanying fission and either emitted from the nucleus of an atom or emitted by some radionuclide or fission product. Gamma rays are very penetrating and can be stopped only by dense materials (such as lead) or a thick layer of shielding materials.

Gaussian Plume — The distribution of material (a plume) in the atmosphere resulting from the release of pollutants from a stack or other source. The distribution of concentrations about the centerline of the plume, which is assumed to decrease as a function of its distance from the source and centerline (Gaussian distribution), depends on the mean wind speed and atmospheric stability.

Genetic Effects — The outcome resulting from exposure to mutagenic chemicals or radiation which results in genetic changes in germ line or somatic cells.

(1) Effects on genetic material in reproductive cells cause trait modifications that can be passed from parents to offspring.

(2) Effects on genetic material in nonreproductive cells result in tissue or organ modifications (e.g., liver tumors) that do not pass from parents to offspring.

Geology — The science that deals with the Earth: the materials, processes, environments, and history of the planet, including the rocks and their formation and structure.

Getter — Material that absorbs free tritium gas and chemically binds it within its own structure. One such structure is zirconium alloy.

Global Warming — The theory that certain gases such as carbon dioxide, methane, and chlorofluorocarbon in the Earth's atmosphere effectively restrict radiation cooling, thus elevating the Earth's ambient temperatures.

Groundshine — The radiation dose received from an area on the ground where radioactivity has been deposited by a radioactive plume or cloud.

Groundwater — The supply of water found beneath the Earth's surface, usually in aquifers, which may supply wells and springs.

Habitat — The environment occupied by individuals of a particular species, population, or community.

Half-Life — The time in which half the atoms of a radioactive isotope decay to another nuclear form. Half-lives vary from millionths of a second to billions of years.

Hazardous Chemical — Under 29 CFR 1910, Subpart Z, "hazardous chemicals" are defined as "any chemical which is a physical hazard or a health hazard." Physical hazards include combustible liquids, compressed gases, explosives, flammables, organic peroxides, oxidizers, pyrophorics, and reactives. A health hazard is any chemical for which there is good evidence that acute or chronic health effects occur in exposed employees. Hazardous chemicals include carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, agents that act on the hematopoietic system, and agents that damage the lungs, skin, eyes, or mucous membranes.

Hazard Index — A sum of the Hazard Quotients for all chemicals now being used at a site and those proposed to be added to yield cumulative levels for a site. A Hazard Index value of 1.0 or less means that no adverse human health effects (noncancer) are expected to occur.

Hazard Quotient — The value used as an assessment of noncancer–associated toxic effects of chemicals, e.g., kidney or liver dysfunction. It is a ratio of the estimated exposure to that expected to produce no adverse health effects. It is independent of a cancer risk, which is calculated only for those chemicals identified as carcinogens.

Hazardous Material — A material, including a hazardous substance, as defined by 49 CFR 171.8, which poses a risk to health, safety, and property when transported or handled.

Hazardous/Toxic Air Pollutants — Air pollutants known or suspected to cause serious health problems such as cancer, poisoning, or sickness, and may have immunological, neurological, reproductive, developmental, or respiratory effects.

Hazardous/Toxic Waste — Any solid waste (can also be semisolid or liquid, or contain gaseous material) having the characteristics of ignitability, corrosivity, toxicity, or reactivity, defined by the Resource Conservation and Recovery Act and identified or listed in 40 CFR 261 or by the Toxic Substances Control Act.

Hazardous Waste — A by-product of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity) or appears on special U.S. Environmental Protection Agency lists.

Heat Exchanger — A device that transfers heat from one fluid (liquid or gas) to another.

Heavy Metals — Metallic or semimetallic elements of high molecular weight, such as mercury, chromium, cadmium, lead, and arsenic, that are toxic to plants and animals at known concentrations.

Heavy Water — A form of water in which the hydrogen atoms are replaced by deuterium atoms. Deuterium is an isotope of the element of hydrogen with one neutron and one proton in the nucleus.

Heavy Water Reactor — A nuclear reactor in which circulating heavy water is used to cool the reactor core and to moderate (reduce the energy of) the neutrons created in the core by the fission reactions.

Helium-3 — A nonradioactive isotope of the element helium, that is produced as a tritium decay product.

Helium-4 — The naturally occurring isotope of the element helium, that is also a by-product in the atomic conversion of lithium to tritium.

High Efficiency Particulate Air Filter (HEPA) — A filter used to remove very small particulates from dry gaseous effluent streams.

High-Level Waste — The highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid waste derived from the liquid. High-level waste contains a combination of transuranic waste and fission products in concentrations requiring permanent isolation.

Historic Resources — Archaeological sites, architectural structures, and objects produced after the advent of written history dating to the time of the first Euro-American contact in an area.

Hold-Down Assembly — The mechanical device that integrates the tritium-producing burnable absorber rods into an assembly and secures this assembly into the reactor fuel assembly.

HT — Tritiated hydrogen molecule which emits a low-energy beta particle and has a half-life of 12.3 years.

***Hydrology* —** The science dealing with the properties, distribution, and circulation of natural water systems.

***Hydrodynamics* —** The study of the motion of a fluid and of the interactions of the fluid with its boundaries, especially in the case of an incompressible inviscid fluid.

***Ignition* —** Self-sustained fusion burn of light nuclei.

***Impingement* —** The process by which aquatic organisms too large to pass through the screens of a water intake structure become caught on the screens and are unable to escape.

***Implosion* —** With respect to nuclear weapons, the sudden inward compression and reduction in volume of fissionable material with chemical explosives in a nuclear weapon.

***Incident-Free Risk* —** The radiological or chemical impacts resulting from emissions during normal commercial light water reactor operations and from packages aboard vehicles in normal transport. This includes the radiation or hazardous chemical exposure of specific population groups and workers.

***Indirect Economic Effects* —** Indirect effects result from the need to supply industries experiencing direct economic effects with additional outputs to allow them to increase their production. The additional output from each directly affected industry requires inputs from other industries within a region (i.e., purchases of goods and services). This results in a multiplier effect to show the change in total economic activity resulting from a new activity in a region.

***Indirect Jobs* —** Within a regional economic area, jobs generated or lost in related industries as a result of a change in direct employment.

***Induced Economic Effects* —** The spending of households resulting from direct and indirect economic effects. Increases in output from a new economic activity lead to an increase in household spending throughout the economy as firms increase their labor inputs.

***Injection Wells* —** A well that takes water from the surface into the ground, either through gravity or by mechanical means.

***Ion* —** An atom that has too many or too few electrons, causing it to be electrically charged; an electron that is not associated (in orbit) with a nucleus.

***Ion Exchange* —** A unit physiochemical process that removes anions and cations, including radionuclides, from liquid streams (usually water) for the purpose of purification or decontamination.

***Ionizing Radiation* —** Alpha particles, beta particles, gamma rays, neutrons, high-speed electrons, high-speed protons, and other particles or electromagnetic radiation that can displace electrons from atoms or molecules, thereby producing ions.

***Isotope* —** An atom of a chemical element with a specific atomic number and atomic mass. Isotopes of the same element have the same number of protons, but different numbers of neutrons and different atomic masses.

***Joule* —** A metric unit of energy, work, or heat, equivalent to 1 watt-second, 0.737 foot-pound, or 0.239 calories.

***Lacustrine* —** Found or formed in lakes; also, a type of wetland situated on or near a lake.

Landscape Character — The arrangement of a particular landscape as formed by the variety and intensity of the landscape features (land, water, vegetation, and structures) and the four basic elements (form, line, color, and texture). These factors give an area a distinctive quality that distinguishes it from its immediate surroundings.

Large Release — A release of radioactive material that would result in doses greater than 25 rem to the whole body or 300 rem to the thyroid at 1.6 kilometer (1 mile) from the control perimeter (security fence) of a reactor facility.

Latent Fatalities — Fatalities associated with acute and chronic environmental exposures to chemical or radiation that occur within 30 years of exposure.

Lead Test Assembly — Tritium-producing burnable absorber rods (TPBARs) assembled and inserted in limited quantities into the Watts Bar 1 commercial light water reactor to confirm the TPBARs' performance.

Lentic — Pertaining to or living in still water.

Licensee Amendment — Changes to an existing reactor's operating license that are approved by the U. S. Nuclear Regulatory Commission.

Light Water — The common form of water (a molecule with two hydrogen atoms and one oxygen atom, H_2O) in which the hydrogen atom consists completely of the normal hydrogen isotope (one proton).

Light Water Reactor — A nuclear reactor in which circulating light water is used to cool the reactor core and to moderate (reduce the energy of) the neutrons created in the core by the fission reactions.

Lithium-6 — The isotope of the element lithium that changes to tritium and helium-4 when a neutron is absorbed by the lithium nucleus.

Long-Lived Radionuclides — Radioactive isotopes with half-lives greater than about 30 years.

Loss-of-Coolant Accident — An accident that results from the loss of reactor coolant because of a break in the reactor coolant system.

Low-Level Waste — Waste that contains radioactivity, but is not classified as high-level waste, transuranic waste, spent nuclear fuel, or by-product material as defined by Section 11e (2) of the Atomic Energy Act of 1954, as amended. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic waste is less than 100 nanocuries per gram. Some low-level waste is considered classified because of the nature of the generating process and/or constituents, because the waste would tell too much about the process.

Macrophyte — A member of the macroscopic plant life, especially in a body of water.

Maximum Contaminant Level — The maximum permissible level of a contaminant in water delivered to any user of a public drinking water system. Maximum contaminant levels are enforceable standards under the Safe Drinking Water Act.

Maximally Exposed Offsite Individual — A hypothetical person who could potentially receive the maximum dose of radiation or hazardous chemicals.

Megajoule — A unit of heat, work, or energy equal to 1 million joules. See "Joule."

Megawatt (MW) — A unit of power equal to 1 million watts. "Megawatt-thermal" is commonly used to define heat produced, while "megawatt-electric" defines electricity produced.

Meteorology — The science dealing with the atmosphere and its phenomena, especially as relating to weather.

Migration — The natural movement of a material through the air, soil, or groundwater; also, seasonal movement of animals from one area to another.

Migratory Bird Treaty Act — This act states that it is unlawful to pursue, take, attempt to take, capture, possess, or kill any migratory bird, or any part, nest, or egg of any such bird, other than permitted activities.

Mississippian — Artifacts from the North American archaeological period dating from 500 AD to 1200 AD.

Mixed Waste — Waste that contains both "nonradioactive hazardous waste" and "radioactive waste" as defined in this glossary.

Moderator — A material used to decelerate neutrons in a reactor from high energies to low energies.

Mollusks — Unsegmented, invertebrate animals including gastropods, pelecypods, and cephalopods.

National Ambient Air Quality Standards (NAAQS) — Uniform, national air quality standards established by the Environmental Protection Agency under the authority of the Clean Air Act that restrict ambient levels of criteria pollutants to protect public health (primary standards) or public welfare (secondary standards), including plant and animal life, visibility, and materials. Standards have been set for ozone, carbon monoxide, particulates, sulfur dioxide, nitrogen, nitrogen dioxide, and lead.

National Emission Standards for Hazardous Air Pollutants — A set of national emission standards for listed hazardous pollutants emitted from specific classes or categories of new and existing sources.

National Environmental Policy Act of 1969 (NEPA) — This Act is the basic national charter for the protection of the environment. It requires the preparation of an environmental impact statement for every major Federal action that may significantly affect the quality of the human or natural environment. Its main purpose is to provide environmental information to decisionmakers so their actions are based on an understanding of the potential environmental consequences of a proposed action and its reasonable alternatives.

National Historic Preservation Act — This Act provides that property resources with significant national historic value be placed on the national Register of Historic Places. It does not require any permits, but, pursuant to Federal code, if a proposed action might impact an historic property resource, it mandates consultation with the proper agencies.

National Pollutant Discharge Elimination System (NPDES) — Federal permitting system required for water pollution effluents under the Clean Water Act, as amended.

National Register of Historic Places — A list maintained by the Secretary of the Interior of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or national significance under Section 2(b) of the Historic Sites Act of 1935 (16 U.S.C. 462) and Section 101(a) (1) (A) of the National Historic Preservation Act of 1966, as amended.

Neutron — An uncharged elementary particle with a mass slightly greater than that of the proton, found in the nucleus of every atom heavier than hydrogen-1. A free neutron is unstable and decays with a half-life of about 13 minutes into an electron and a proton; used in the fission process.

Neutron Flux — The product of neutron number density and velocity (energy), giving an apparent number of neutrons flowing through a unit area per unit time.

Neutron Poison — A chemical solution (e.g., a boron or component sheet or a burnable absorber rod) inserted into a nuclear reactor or spent fuel pool to absorb neutrons and end criticality. Any material with a strong affinity for absorbing neutrons without generating new neutrons that can be used to control the nuclear chain reaction.

Nitrogen (N_2) — A colorless, odorless gaseous element that constitutes about four-fifths of the volume of the atmosphere.

Nitrogen Oxides — Refers to the oxides of nitrogen, primarily NO (nitrogen oxide) and NO_2 (nitrogen dioxide). These are produced in the combustion of fossil fuels and can constitute an air pollution problem. Nitrogen dioxide emissions contribute to acid deposition and formation of atmospheric ozone.

Noise — Any sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying (unwanted sound).

Nonattainment Area — An air quality control region (or portion thereof) in which the Environmental Protection Agency has determined that ambient air concentrations exceed national ambient air quality standards for one or more criteria pollutants.

Notice of Intent — Announces the scoping process. The Notice of Intent is usually published in the Federal Register and a local newspaper. The scoping process includes holding at least one public meeting and requesting written comments on what issues and environmental concerns an environmental impact statement should address.

Nuclear Assembly — Collective term for the primary, secondary, and radiation case of a nuclear warhead.

Nuclear Component — A part of a nuclear weapon that contains fissionable or fusionable material.

Nuclear Criticality — (See "criticality.")

Nuclear Fuel Cycle — The path followed by the nuclear fuel in its various states from mining the ore to waste disposal. The basic fuel materials for the generation of nuclear power are the elements uranium and thorium.

Nuclear Grade — Material of a quality adequate for use in a nuclear application.

Nuclear Material — Composite term applied to: (1) special nuclear material; (2) source material such as uranium, thorium, or ores containing uranium or thorium; and (3) by-product material, which is any radioactive material that is made radioactive by exposure to a radiation incident or to the process of producing or using special nuclear material.

Nuclear Nonproliferation Treaty — An international treaty signed in 1968 and extended in 1996 that seeks to limit nuclear weapons capabilities to the five countries (United States, France, England, Russia, and China) that possessed such weapons before 1967.

Nuclear Power Plant — A facility that converts nuclear energy into electrical power. In a commercial light water reactor, heat produced in the nuclear reactor is used to make steam, which drives a turbine connected to an electric generator.

Nuclear Radiation — Particles (alpha, beta, neutrons) or photons (gamma) emitted from the nucleus of unstable radioactive atoms as a result of radioactive decay.

Nuclear Reaction — A reaction in which an atomic nucleus is transformed into another isotope of that respective nuclide, or into another element altogether; it is always accompanied by the liberation of either particles or energy.

Nuclear Reactor — A device that sustains a controlled nuclear fission chain reaction that releases energy in the form of heat.

Nuclear Regulatory Commission (NRC) — The Federal agency that regulates the civilian nuclear power industry in the United States.

Nuclear Weapon — The general name given to any weapon in which the explosion results from the energy released by reactions involving atomic nuclei; either fission, fusion, or both.

Nuclear Weapons Complex — The sites supporting the research, development, design, manufacture, testing, assessment, certification, and maintenance of the nation's nuclear weapons and the subsequent dismantlement of retired weapons.

Nuclide — A species of atom characterized by the constitution of its nucleus and, hence, by the number of protons, the number of neutrons, and the energy content.

Numerical Simulation — The use of mathematical algorithms and models of physical processes to calculationally simulate the behavior or performance of a device or complex system.

Occupational Safety and Health Administration — Oversees and regulates workplace health and safety, created by the Occupational Safety and Health Act of 1970.

Off Site — As used in the environmental impact statement, the term denotes a location, facility, or activity occurring outside of the boundary of the reactor facility.

Outfall — The discharge point of a drain, sewer, or pipe as it empties into a body of water.

Ozone — The triatomic form of oxygen; in the stratosphere, ozone protects the Earth from the sun's ultraviolet rays, but in lower levels of the atmosphere, ozone is considered an air pollutant.

Packaging — With regard to hazardous or radionuclide materials, the assembly of components necessary to ensure compliance with Federal regulations. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The vehicle tie-down system and auxiliary equipment may be designated as part of the packaging.

Palustrine — Found or formed in marshes; also, a type of wetland situated in or near a marsh.

Particulate Matter — Air pollutants including dust, dirt, soot, smoke, or liquid droplets emitted into the air. "Total suspended particulate" was first used as the indicator for particulate concentrations. Current standards use the indicators "PM_{10}" and "$PM_{2.5}$," which include only those particles with an aerodynamic diameter smaller than or equal to 10 micrometers and 2.5 micrometers, respectively. The smaller particles are more responsible for adverse health effects because they reach further into the respiratory tract.

Permeability — In geology, the ability of rock or soil to transmit a fluid.

Permutation — Changing the order of elements arranged in a particular order.

Person-Rem — The unit of collective radiation dose to a given population; the sum of the individual doses received by a population segment.

Plume — A flowing, often somewhat conical, trail of emissions from a continuous point source.

Plume Immersion — With regard to radiation, the situation in which an individual is enveloped by a cloud of radiation gaseous effluent and receives an external radiation dose.

Plutonium — A heavy, radioactive, metallic element with the atomic number 94. It is produced artificially in a reactor by bombardment of uranium with neutrons and is used in the production of nuclear weapons.

Pounds per Square Inch — A measure of pressure; atmospheric pressure is about 14.7 pounds per square inch.

Pressurized Water Reactor — A light water reactor in which heat is transferred from the core to an exchanger by water kept under pressure in the primary system. Steam is generated in a secondary circuit. Many reactors producing electric power are pressurized water reactors.

Prevention of Significant Deterioration — An Environmental Protection Agency program, mandated by the Clean Air Act, in which state or Federal permits are required that are intended to limit increases in air pollutant concentrations by restricting emissions for new or modified sources in places where air quality is already better than required to meet primary and secondary ambient air quality standards.

Primary System — With regard to nuclear reactors, the system that circulates a coolant (e.g., water) through the reactor core to remove the heat of reaction.

Prime Farmland — Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oil-seed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor without intolerable soil erosion, as determined by the Secretary of Agriculture (Farmland Protection Act of 1981, 7 CFR 7, paragraph 658).

Probabilistic Risk Assessment — A comprehensive, logical, and structured methodology to identify and quantitatively evaluate significant accident sequences and their consequences.

Probable Maximum Flood — Flood levels predicted for a scenario having hydrological conditions that maximize the flow of surface waters.

Programmatic Environmental Impact Statement — A legal document prepared in accordance with the requirements of 102(2)(C) of the National Environmental Policy Act which evaluates the environmental impacts of proposed Federal actions that involve multiple decisions potentially affecting the environment at one or more sites.

Proliferation (Nuclear) — The spread of nuclear weapons and the materials and technologies used to produce them.

Qualitative Environmental Impacts — 10 CFR 51, Appendix B defines the qualitative terms “small,” “moderate,” and “large” as follows:

Small — Environmental effects are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing

radiological impacts, the U.S. Nuclear Regulatory Commission (NRC) has concluded that those impacts that do not exceed permissible levels in the NRC's regulations are considered small.

Moderate — Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

Large — Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Quality Factor — The principal modifying factor that is employed to derive dose equivalent from absorbed dose.

Rad — See "radiation absorbed dose."

Radiation — The emitted particles or photons from the nuclei of radioactive atoms. Some elements are naturally radioactive; others are induced to become radioactive by bombardment in a reactor. Naturally occurring radiation is indistinguishable from induced radiation.

Radiation Absorbed Dose (rad) — The basic unit of absorbed dose equal to the absorption of 0.01 Joule per kilogram of absorbing material.

Radioactive Waste — Materials from nuclear operations that are radioactive or are contaminated with radioactive materials, and for which use, reuse, or recovery are impractical.

Radioactivity — The spontaneous decay or disintegration of unstable atomic nuclei, accompanied by the emission of radiation.

Radioisotopes — Radioactive nuclides of the same element (same number of protons in their nuclei) that differ in the number of neutrons.

Radionuclide — A radioactive element characterized according to its atomic mass and atomic number which can be man-made or naturally occurring.

Radon — Gaseous, radioactive element with the atomic number 86 resulting from the radioactive decay or radium. Radon occurs naturally in the environment, and can collect in unventilated enclosed areas, such as basements. Large concentrations of radon can cause lung cancer in humans.

RADTRAN — A computer code that combines user-determined meteorological, demographic, transportation, packaging, and material factors with health physics data to calculate the expected radiological consequences and accident risk of transporting radioactive material.

Reactor Accident — See "design-basis accident; severe accident."

Reactor Coolant System — The system used to transfer energy from the reactor core either directly or indirectly to the heat rejection system.

Reactor Core — In a heavy water reactor: the fuel assemblies including the fuel and target rods, control assemblies, blanket assemblies, safety rods, and coolant/moderator. In a light water reactor: the fuel assemblies including the fuel and target rods, control rods, and coolant/moderator. In a modular high-

temperature gas-cooled reactor: the graphite elements including the fuel and target elements, control rods, and other reactor shutdown mechanisms, and the graphite reflectors.

Reactor Facility — Unless it is modified by words such as containment, vessel, or core, the term reactor facility includes the housing, equipment, and associated areas devoted to the operation and maintenance of one or more reactor cores. Any apparatus that is designed or used to sustain nuclear chain reactions in a controlled manner, including critical and pulsed assemblies and research, tests, and power reactors, is defined as a reactor. All assemblies designed to perform subcritical experiments that could potentially reach criticality are also to be considered reactors.

Record of Decision — A document prepared in accordance with the requirements of the Council on Environmental Quality and National Environmental Policy Act regulations 40 CFR 1505.2, that provides a concise public record of the decision on a proposed Federal action for which an environmental impact statement was prepared. A Record of Decision identifies the alternatives considered in reaching the decision, the environmentally preferable alternative(s), factors balanced in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not.

Recycling — With regard to tritium in nuclear weapons, the recovery, purification, and reuse of tritium contained in tritium reservoirs within the nuclear weapons stockpile.

Refueling Outage — The period of time that a reactor is shut down for refueling operations. A refueling outage usually lasts four to eight weeks.

Regional Economic Area — A geographic area consisting of an economic node and the surrounding counties that are economically related and include the places of work and residences of the labor force. Each regional economic area is defined by the U.S. Bureau of Economic Analysis.

Region of Influence — A site-specific geographic area that includes the counties where approximately 90 percent of the current U.S. Department of Energy and/or contractor employees reside.

Rem — See “roentgen equivalent man.”

Remediation — The process, or a phase in the process, of rendering radioactive, hazardous, or mixed waste environmentally safe, whether through processing, entombment, or other methods.

Resource Conservation and Recovery Act, as amended — The Act that provides a “cradle-to-grave” regulatory program for hazardous waste which established, among other things, a system for managing hazardous waste from its generation until its ultimate disposal.

Riparian — Of, on, or relating to the banks of a natural course of water.

Risk — A quantitative or qualitative expression of possible loss that considers both the probability that a hazard will cause harm and the consequences of that event.

Risk Assessment (chemical or radiological) — The qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and/or the environment by the presence or potential presence and/or use of specific chemical or radiological materials.

Roentgen — A unit of exposure to ionizing X or gamma radiation equal to or producing 1 electrostatic unit of charge per cubic centimeter of air. It is approximately equal to 1 rad.

Roentgen Equivalent Man (rem) — A measure of radiation dose (i.e., the average background radiation dose is 0.3 rem per year). The unit of biological dose equal to the product of the absorbed dose in rads; a quality factor, which accounts for the variation in biological effectiveness of different types of radiation; and other modifying factors.

Runoff — The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and eventually enters streams.

Safe Drinking Water Act — This Act protects the quality of public water supplies, water supply and distribution systems, and all sources of drinking water.

Safety — With regard to nuclear weapons, minimizing the possibility that a nuclear weapon will be exposed to accidents and preventing the possibility of nuclear yield or plutonium dispersal should there be an accident involving a nuclear weapon.

Safety Analysis Report — A safety document that provides a complete description and safety analysis of a reactor design, normal and emergency operations, hypothetical accidents and their predicted consequences, and the means proposed to prevent such accidents or mitigate their consequences.

Safety Evaluation Report — A document prepared by the U.S. Nuclear Regulatory Commission that evaluates documentation (i.e., technical specifications, safety analysis reports, and special safety reviews and studies) submitted by a reactor licensee for its approval. This ensures that all of the safety aspects of part or all of the activities conducted at a reactor are formally and thoroughly analyzed, evaluated, and recorded.

Sanitary waste — Wastes generated by normal housekeeping activities, liquid or solid (including sludge), which are not hazardous or radioactive.

Scope — In a document prepared pursuant to the National Environmental Policy Act of 1969, the range of actions, alternatives, and impacts to be considered.

Scoping — The solicitation of comments from interested persons, groups, and agencies at public meetings, public workshops, in writing, electronically, or via fax to assist in defining the proposed action, identifying alternatives, and developing preliminary issues to be addressed in an environmental impact statement.

Secondary System — The system that circulates a coolant (water) through a heat exchanger to remove heat from the primary system.

Security — With regard to nuclear weapons, minimizing the likelihood of unauthorized access to or loss of custody of a nuclear weapon or weapon system, and ensuring that the weapon can be recovered should unauthorized access or loss of custody occur.

Seismic — Pertaining to any Earth vibration, especially an earthquake.

Seismic Zone — An area defined by the Uniform Building Code (1991), designating the amount of damage to be expected as the result of earthquakes. The United States is divided into six zones: (1) Zone 0: no damage; (2) Zone 1: minor damage, corresponds to intensities V and VI of the modified Mercalli intensity scale; (3) Zone 2A: moderate damage, corresponds to intensity VII of the modified Mercalli intensity scale (eastern U.S.); (4) Zone 2B: slightly more damage than 2A (western U.S.); (5) Zone 3: major damage, corresponds to intensity VII and higher of the modified Mercalli intensity scale; (6) Zone 4: areas within Zone 3 determined by proximity to certain major fault systems.

Severe Accident — An accident with a frequency rate of less than 10^{-6} per year that would have more severe consequences than a design-basis accident, in terms of damage to the facility, offsite consequences, or both. Also called "beyond design-basis reactor accidents" for this environmental impact statement.

Sewage — The total of organic waste and wastewater generated by an industrial establishment or a community.

Shielding — With regard to radiation, any material of obstruction (bulkheads, walls, or other construction) that absorbs radiation in order to protect personnel or equipment.

Short-Lived Activation Products — An element formed from neutron interaction that has a relatively short half-life and which is not produced from the fission reaction (e.g., a cobalt isotope formed from impurities in the metal of the reactor piping).

Short-Lived Nuclides — Radioactive isotopes with half-lives no greater than about 30 years (e.g., cesium-137 and strontium-90).

Shrink-Swell Potential — Refers to the potential for soils to contract while drying and expand after wetting.

Shutdown — For a U.S. Department of Energy (DOE) reactor, that condition in which the reactor has ceased operation and DOE has declared officially that it does not intend to operate it further (see DOE Order 5480.6, *Safety of Department of Energy-Owned Nuclear Reactors*).

Silt — A sedimentary material consisting of fine mineral particles intermediate in size between sand and clay.

Source Term — The estimated quantities of radionuclides or chemical pollutants released to the environment.

Special Nuclear Materials — As defined in Section 11 of the Atomic Energy Act of 1954, special nuclear material means: (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the U.S. Nuclear Regulatory Commission determines to be special nuclear material; or (2) any material artificially enriched by any of the above. Tritium is NOT a special nuclear material.

Standardization (Epidemiology) — Techniques used to control the effects of differences (e.g., age) between populations when comparing disease experience. The two main methods are:

(1) Direct method, in which specific diseases rated in the study population are averaged, using as weights the distribution of the comparison population.

(2) Indirect method, in which the specific disease rates in the comparison population are averaged, using as weights the distribution of the study population.

START I and II — Terms which refer to negotiations between the United States and Russia (the former Soviet Union during START I negotiations) aimed at limiting and reducing strategic nuclear weapons. START I discussions began in 1982 and eventually led to a ratified treaty in 1988. The START II protocol, which has not been fully ratified, will attempt to further reduce the acceptable levels of nuclear weapons ratified in START I.

Sulfur Oxides — Common air pollutants, primarily sulfur dioxide (SO_2), a heavy, pungent, colorless gas formed in the combustion of fossil fuels, which is considered a major air pollutant, and sulfur trioxide. SO_2 is involved in the formation of acid rain. It can also irritate the upper respiratory tract and cause lung damage.

Surface Water — Water on the Earth's surface, as distinguished from water in the ground (groundwater).

Technical Specifications — With regard to U.S. Nuclear Regulatory Commission (NRC) regulations, part of an NRC license authorizing the operation of a nuclear reactor facility. A technical specification establishes requirements for items such as safety limits, limiting safety system settings, limiting control settings, limiting conditions for operation, surveillance requirements, design features, and administrative controls.

Threatened Species — Any species designated under the Endangered Species Act as likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Threshold Limit Values — The recommended highest concentrations of contaminants to which workers may be exposed according to the American Conference of Governmental Industrial Hygienists.

Toxic Substances Control Act of 1976 — This Act authorizes the Environmental Protection Agency to secure information on all new and existing chemical substances and to control any of these substances determined to cause an unreasonable risk to public health or the environment. This law requires that the health and environmental effects of all new chemicals be reviewed by the Environmental Protection Agency before they are manufactured for commercial purposes.

Transients — Events that could cause a change or disruption of plant thermal, hydraulic, or neutronic behavior.

Tritium — A radioactive isotope of the element hydrogen with two neutrons and one proton. Common symbols for the isotope are “H-3" and “T.” Tritium has a half-life of 12.3 years.

Tritium Extraction Facility — A facility used for the extraction of tritium from the TPBARs. This facility is planned for construction at the Savannah River Site in Aiken, South Carolina.

Tritium-Producing Burnable Absorber Rods (TPBARs) — Rods that replace the normally used burnable absorber rods in a reactor for the purpose of producing tritium. TPBARs contain lithium-6.

Turbine — A machine for directly converting the kinetic energy and/or thermal energy of a flowing fluid (air, hot gas, steam, or water) into useful rotational energy.

Unusual Occurrence — Any unusual or unplanned event that adversely affects or potentially affects the performance, reliability, or safety of a facility.

Uranium — A heavy, silvery-white metallic element (atomic number 92) with several radioactive isotopes that is used as fuel in nuclear reactors.

Viewshed — The extent of an area that may be viewed from a particular location. Viewsheds are generally bounded by topographic features such as hills or mountains.

Visual Resource Management Class — A class defines the different degrees of modification allowed to the basic elements of landscape. They are: Class 1 - applied to wilderness areas, wild and scenic rivers, and other similar situations; Class 2 - contrasts are seen, but do not attract attention; Class 3 - contrasts caused by a cultural activity are evident, but remain subordinate to the existing landscape; Class 4 - contrasts that attract attention and are dominant features of the landscape in terms of scale, but repeat the contrast of the characteristic landscape; Class 5 - applied to areas where unacceptable cultural modification has lowered scenic quality (where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to one of the four other classifications).

Volatile Organic Compounds — A broad range of organic compounds, often halogenated, that vaporize at ambient or relatively low temperatures, such as benzene, chloroform, and methyl alcohol. With regard to air pollution, any organic compound that participates in atmospheric photochemical reaction, except for those designated by the Environmental Protection Agency administrator as having negligible photochemical reactivity.

Warhead — Collective term for the package of nuclear assembly and nonnuclear components that can be mated with a delivery vehicle or carrier to produce a deliverable nuclear weapon.

Waste Minimization and Pollution Prevention — An action that economically avoids or reduces the generation of waste and pollution by source reduction, reducing the toxicity of hazardous waste and pollution, improving energy use, or recycling. These actions will be consistent with the general goal of minimizing present and future threats to human health, safety, and the environment.

Weighting Factor — With regard to radiation, the fraction of the total health risk resulting from uniform whole-body irradiation that could be contributed to that particular tissue.

Whole-Body Dose — With regard to radiation, the dose resulting from the uniform exposure of all organs and tissues in a human body. (Also see "effective dose equivalent.")

Wind Rose — A depiction of wind speed and direction frequency for a given period of time.

Woodland — Artifacts from the North American archaeological period dating from 1000 BC to 500 AD.

X/Q (Chi/Q) — The relative calculated air concentration due to a specific air release and atmospheric dispersion; units are (seconds per cubic meter). For example (Curies per cubic meter)/(Curies per second)= (seconds per cubic meter) or (grams per cubic meter)/(grams per second) = (seconds per cubic meter).

Zebra Mussel — An imported mussel which interferes with, among other things, water intake structures.

Zircaloy-4 — An alloy of zirconium metal used as getter material in tritium-producing burnable absorber rods.